

Patent claims

1. A method for treatment of gas exiting the anode side (301) of a solid oxide fuel cell stack (1) fuelled with a carbon containing fuel (100) in a power producing process, 5 characterized in that the anode gas and cathode gas are kept separated by a seal system in the SOFC stack (4) and that the main part of the H₂ and CO in the anode exhaust (351) is separated from the CO₂ in said exhaust (301) by a separation process based on H₂ selective 10 membranes (350).
2. A method according to claim 1, characterized in that the anode exhaust (359) is treated such that most of the CO₂ is not emitted to the atmosphere.
- 15 3. A method according to claim 1, characterized in that steam (361) is injected on the permeate side of the hydrogen selective membranes (350).
4. A method according to claim 1, 20 characterized in that the recovered H₂ (355) is fed back to the main SOFC stack (1) and used as fuel.
5. A method according to claim 1, 25 characterized in that the recovered H₂ (355) is used to heat the oxygen depleted air (206) entering the expander (207).
6. A method according to claim 1, characterized in that the recovered H₂ (355) is used to heat the air entering the SOFC stack (205).
7. A method according to claim 1, 30 characterized in that the recovered H₂ (355) is exported as a sales product.

8. A method according to claim 1,
characterised in that recovered H₂ (355) is fed to
the desulphurisation unit (101) to provide necessary
hydrogen for hydrodesulphurisation.

5 9. A method for treatment of gas exiting the anode side
(301) of a solid oxide fuel cell stack (1) fuelled with a
carbon containing fuel (100) in a power producing process,
characterised in that the anode gas and cathode
gas are kept separated by a seal system in the SOFC stack
10 (4), that the main part of the H₂ and CO in the anode
exhaust (301) is separated from the CO₂ in said exhaust by
a separation process based on compressing (312), drying
(319) and cooling (321) to a pressure and temperature where
most of the CO₂ is in liquid form (322) and subsequently is
15 separated from the H₂ and CO in a conventional gravity
based separation process (323).

10. A method according to claim 9,
characterised in that the anode exhaust (301) is
treated such that most of the CO₂ is not emitted to the
20 atmosphere.

11. A method according to claim 9,
characterised in that the recovered H₂ an CO (329)
is fed back to the main SOFC stack (1) and used as fuel

12. A method according to claim 9,
25 characterised in that the recovered H₂ an CO (329)
is removed in order to avoid build-up of gases which are
non-condensable and non-combustible.

13. A method according to claim 9,
characterised in that the recovered H₂ an CO (329)
30 is fed to the desulphurisation unit (101) to provide the
necessary hydrogen for hydrodesulphurisation.

References

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